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EXAMINER

VERBITSKY, GAIL KAPLAN

ART UNIT

PAPER NUMBER

2859

DATE MAILED: 07/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/069,037

Applicant(s)

GRAY, ADRIAN L

Examiner

Gail Verbitsky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 33 is/are allowed.
- 6) ☒ Claim(s) 22-32, 34-40 and 42 is/are rejected.
- 7) ☒ Claim(s) 41 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Claim Objections

1. Claims 34, 36, 38, 40-41 are objected to because of the following informalities:

Claim 34: "the wires" in line 2 lacks antecedent basis,

Claims 36: "the sheath" in line 3 and "the beaded" in line 4 lack antecedent basis,

Claim 38: "the tube" in line 1 lacks antecedent basis,

Claim 40: "the sheath" in line 2 lacks antecedent basis,

Claim 41: "the wires" in line 2 lacks antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 22, 26-28, 37, 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over McMurphy in view of Hall, Jr. (U.S. 5464485) [hereinafter Hall] and Francis et al. (4356271) [hereinafter Francis].

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McMurphy discloses in Fig. 1 a thermocouple (thermoelectric device) comprising a tip, an additional external shielding/ protective tube/ sheath having an inner tube 12 and an outer tube (metal) 14 over a filler of a low sintering refractory material (magnesia) 18. It is inherent, that the hot junction is produced by thermocouple wires from the thermocouple cable/ shielding.

McMurphy does not explicitly teach that the refractory material is a particulate borosilicate, as satted in claim 22, that the inner tube is a metal, as stated in claim 23 that the outer tube is constricted, as stated in claim 24. McMurphy does not explicitly teach that a tip of the thermocouple is electrically connected to an insulated (mineral) thermocouple cable, the particular temperature range of drying, and the particular content/ percentage of a borosilicate and a boric acid powder in the refractory material, as satted in claims 26-28, 37, 39.

Hall discloses a device comprising a sensing tip 12 in an electrical connection with a mineral insulated thermocouple cable, the device having an additional external protective shielding 18.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the thermoelectric device, disclosed by McMurphy, so as to have the thermocouple tip in an electrical connection with the thermocouple cable, as taught by Hall, so as to provide a thermocouple junction, necessary for temperature measurements.

Francis discloses a refractory ceramics material containing a borosilicate frit (particles/ particulate) and a boric acid powder. The material is heated at low temperature without melting (low temperature sintering) and dried at temperature of approximately 110°C.

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the refractory filler, disclosed by McMurphy, with a refractory filler comprising a borosilicate particles and a boric acid powder, as taught by Francis, because both of them are alternate types of refractory ceramic material which will perform the same function of protecting thermocouple wires, if one is replaced with the other.

With respect to claims 26: the particular content of the particulate borosilicate, i.e., between 6 and 10 percent by weight of the refractory material, as stated in claims 26, absent any criticality, is only considered to be the “optimum” content, that a person having ordinary skill in the art at the time the invention was made would have been able to determine using routine experimentation based, among other things, on the temperature to be measured and the environment the device is to be used. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

With respect to the particular temperature range, i.e., 135-150°C, as stated in claim 39: the particular temperature range, i.e., 135-150 degree C, as claimed by applicant, absent any criticality, is only considered to be the “optimum” temperature range, that a person having ordinary skill in the art at the time the invention was made would have been able to determine using routine experimentation based, among other things, on the manufacturing process to make the device, etc. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

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4. Claims 23-25, 29-32, 34, 36, 38, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over McMurphy, Hall, Francis as applied to claims 22, 26-28, 37, 39 above, and further in view of Kiln.

McMurphy, Hall and Francis disclose the device as stated above in paragraph 3.

They do not teach that the inner tube made of metal, and that the outer tube is constricted by rolling, as stated in claims 23-25, and the remaining limitations of claims 29-32, 34, 36, 38, 40.

Kilp discloses in Figs. 1-3 a device in the field of applicant's endeavor comprising a protective sheath for a thermoelectric device having two tubes made of a stainless steel material wherein, a refractory ceramics in a form of a bond (bead) is inserted between them, and thus externally to an internal tube, thus making the refractory ceramics act as an additional external shielding. Since refractory ceramics then compacted (constricted) between by a rolling process, it is inherent that a constriction process takes place. Kilp teaches a partial (low temperature) sintering and anneal of the outer tube. It is inherent, that the refractory material is sintered before the thermocouple is used. Kilp teaches that the space between the tube was filled with a mineral insulation and then reduced by rolling or swaging to achieve a required density and minimize porosity.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the shielding, disclosed by McMurphy, Hall and Francis, with the protective tube/ shielding made by a method, as taught by Kilp, because both of them are

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alternate types of protective tubes for thermoelectric devices which will perform the same function, of protecting the thermoelectric device from harsh environment and improve accuracy of measurements.

With respect to the particular temperature range, i.e., 135-150°C, as stated in claim 30: the particular temperature range, i.e., 135-150 degree C, as claimed by applicant, absent any criticality, is only considered to be the “optimum” temperature range, that a person having ordinary skill in the art at the time the invention was made would have been able to determine using routine experimentation based, among other things, on the manufacturing process to make the device, etc. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

With respect to claim 36: the method steps will be met during the normal manufacturing process of the device stated above.

5. Claims 35, 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over McMurphy, Hall, Francis and Kilp as applied to claims 23-25, 29-32, 34, 36, 38, 40 above, and further in view of AU 9712601A [AU] .

McMurphy, Hall, Francis and Kilp disclose the device as stated above in paragraph 4.

They do not explicitly teach that the annealing process follows the constriction, as stated in claims 35, 42.

AU teaches to fill a sheath with a refractory material, reduce the diameter (constrict) and then anneal the sheath.

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device and process of it making, disclosed by McMurphy, Hall, Francis and Kilp, so as to make the annealing follow the constriction, as taught by AU, so as to reinforce the optimal physical properties of the device and make the device less brittle and less susceptible to a damage related to a temperature, pressure, or a harsh environment.

Allowable Subject Matter

6. Claim 33 is allowed.
7. Claim 41 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments with respect to claims 22-42 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in the PTO-892 and not mentioned above disclose related devices.
10. Any inquiry related to this communication should be directed to the Examiner Verbitsky who can be reached at (703) 306-5473 Monday through Friday 7:30 to 4:00 ET.

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Any inquiry of general nature should be directed to the Group Receptionist whose telephone number is (703) 308-0956.

GKV

July 10, 2003

Gail Verbitsky

A handwritten signature in cursive script, appearing to read 'G. Verbitsky', written in black ink.

Patent Examiner, TC 2800